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ABSTRACT

This paper describes five experimental studies which explored the influence of fathers' home caregiving and interactional characteristics on their infant's laboratory behavior. Approximately 300 families with children ranging in age from 6 to 24 months were studied. Each infant's reactions were observed as a function of the manipulation of the presence and absence of the mother, the father, and a female stranger in the playroom. In one study, a direct attempt was made to increase the amount of father interaction at home in order to observe any effects on the infant's laboratory behavior. Problems of methodology are discussed, and father-caregiving patterns noted. While a relationship to the father was seen to be independent of the father's involvement in child care, some minimal level of interaction seemed necessary. Extensive paternal caregiving was related to the preferences for the father in the laboratory and shortened duration of separation protest. The final study demonstrated that manipulation of father-infant interaction at home directly influences infant-father interaction in a laboratory setting. (Author/BRT)

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Father Caretaking Characteristics and Their Influence on Infant-Father Interaction

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ABSTRACT

The influence of father's interactive and child-care characteristics on the infant's social behavior is explored in 5 experimental studies of infant-father interaction. Problems of methodology are discussed and father-caregiving patterns are noted. The relationship to the father was seen to be independent of the extent of his involvement in child care, although some minimal level of interaction seemed necessary. Extensive paternal caregiving was related to the preferences for the father in the laboratory and shortened duration of separation protest. The final study demonstrated that manipulation of father-infant interaction at home directly influences infant-father interaction in a laboratory setting.

Introduction

Until recently most psychologists assumed that infants related only to their mother; the father's relation to his infant was ignored. However, in the last few years researchers have demonstrated that infant-father relationships do, in fact, exist (e.g. Kotelchuck, 1972; Lewis, Weinraub, Ban, 1972; Cohen and Campos, 1974; and Lamb, 1975).

This observation logically leads to the question of whether differential paternal interaction influences the child's development. Before trying to establish any long-term effects, it must first be demonstrated that the father's interaction has an immediate influence on the child. In this paper I would like to begin to document the father's early influence on his child by examining the relationship between the father's caregiving and interactive characteristics at home and the infant's laboratory behavior.

Methodologically there are at least three ways to demonstrate a relation between home caregiving characteristics and the infant's laboratory behavior. The least sophisticated but the easiest method is correlational. Correlations between reported events at home and what occurs in the laboratory can be calculated without any prior manipulations in the design. The experimenter exerts no control over the distribution of data being examined. This method is probably the most commonly used one, especially where home caregiving characteristics are incidentally collected and the relation between home caregiving characteristics and laboratory behavior is secondary to the goal of the laboratory study.

Correlational studies can be used to generate hypotheses; but these must be examined cautiously. First, if the distribution of either home caregiving and interactive characteristics or laboratory behavior are markedly skewed, then no significant correlation will be found even where one might exist. This problem is almost inherent in infant-father studies, as most fathers display a very limited range of caregiving and interaction with their infants, highly skewed towards no involvement. Second, even if a significant association were found, one could always argue that it is a spurious finding. For example, if high interactive fathers predict bright children, one could argue that the brightness is really due to the mothers, who besides stimulating their children also marry interactive fathers. Hence, a high father-infant correlation would have been found, but it would not be causal.

A much more powerful variation of the correlational methodology involves prior stratification of fathers on the basis of their home caregiving characteristics; i.e., an examination of equal number of father types at discrete points along some continuum. This quasi-experimental method does not examine a cross-section of all fathers, as in the previous method, but only discrete stratified groups of fathers to see if there is an association with the infant's behaviors. Data from an experiment designed in this manner can be examined using analysis of variance, with the stratified father groups as an independent measure and the infant's behavior as the dependent measure. This method is appropriate only when the specific goal of the research is to

directly test hypotheses about effects of home caregiving characteristics.

Compared to the correlational method, stratification is a very powerful technique. The problem of skewedness of data is rectified. If any relation exists, one should find it. However, this model is still subject to the arguments about spuriousness; something other than the chosen variable might be both influencing the father home caregiving characteristics and the infants laboratory behavior.

The third and most powerful method is experimental. If one really believes that father home caregiving characteristics causally and directly influence the child's laboratory behaviors, one should be able to manipulate and change the parents' behavior at home and subsequently observe a change in the child's laboratory behavior. This would be the most powerful demonstration of a direct causal relation and would eliminate arguments about possible spuriousness of the findings.

Correlational and stratification methodologies are static models that explore the relationship between what is presently the father's home caregiving characteristics and the infant's behavior. The experimental methodology is a dynamic model that allows one to explore how the child's behavior might change if the parent's behavior changes.

Method and Sample

This paper will examine the relationship between paternal home caregiving and interactional characteristics and the infant's lab behavior in five separate experiments which my colleagues and I

have conducted in the past few years (Kotelchuck, 1972; Spelke, Zelazo, Kagan, Kotelchuck, 1973; Lester, Kotelchuck, Spelke, Sellers and Klein, 1974; Ross, Kagan, Zelazo, Kotelchuck, 1974; and Zelazo, Barber, Kotelchuck and David, 1976). No single study is comprehensive, but all five together make for a coherent picture.

Each experiment uses basically the same paradigm. The infant's behavioral reactions are recorded as a function of the manipulation of the presence and absence of the mother, the father, and a female stranger in a large playroom.

The experiments begin with the infant located in the center of a large playroom surrounded by toys and facing his parents, who were seated at one end of the room. The parents are instructed not to initiate interaction with the child, but to sit quietly and read. They are to respond naturally, but briefly, if the child approached them or if the child is upset. It is emphasized to the parents that the child's spontaneous reactions are of primary interest. The strangers are given similar instructions. Every three minutes, one of the adults was signaled either to enter or depart from the room, according to one of the following schedules. (See page 5.)

Each schedule is composed of 13 episodes and lasted 39 minutes. For either schedule, a parallel set of events occurs for each of the three adults (e.g. the mother leaves the room twice, once with the father remaining and once with the stranger remaining; the father leaves twice, once with mother remaining and once with stranger remaining; the stranger left twice, once with

Order of Presence in the Experimental Room

Episode	Order 1	Order 2
1	Mother and Father	Mother and Father
2	Mother	Father
3	Mother and Stranger	Father and Stranger
4	Stranger	Stranger
5	Stranger and Father	Stranger and Mother
6	Father	Mother
7	Father and Mother	Mother and Father
8	Father	Mother
9	Father and Stranger	Mother and Stranger
10	Stranger	Stranger
11	Stranger and Mother	Stranger and Father
12	Mother	Father
13	Mother and Father	Father and Mother

mother remaining and once with father remaining; the mother enters twice, once with the father present and once with the stranger present, and so forth). These balanced schedules allow for equal comparison of the child's response to each of the three adults. The duration of the child's playing, crying, proximity to a person, touching a person, proximity to the door, vocalizations, smiles, fixations and interactions are coded continuously throughout the 39-minute session.

In total, about 300 families were studied, with the children ranging in age from 6 to 24 months. Most of the studies used middle class first born children from the Boston area. The new element in all of these studies was that fathers and infants were directly observed.

The five experiments had a variety of goals. In three experiments, the relation between home caregiving characteristics and infant lab behavior was a subsidiary question, and was analyzed using a correlational methodology. These three experiments were my doctoral thesis, the goal of which was to show the existence of father-infant ties (Kotelchuck, 1972), a cross cultural replication in Guatemala (Lester et al., 1974), and a replication in the child's own home (Ross et al., 1974). The fourth experiment, using a stratification design, directly explored the effects of high, medium and low interacting fathers on the infant's laboratory behavior at 12 months of age (Spelke et al., 1973). The last study, an experimental design, was an attempt to directly manipulate the father's interaction with his year old child in their home, in order to observe its consequences on the infant's behavior in the laboratory (Zelazo et al. 1976).

Ascertainment of Child Care Information

In all studies, data on home caregiving characteristics was obtained by a joint maternal and paternal interview following the experimental session. Information was obtained about how much time the father spent with the child, played with the child, diapered and fed the child, and so forth. Measures of interaction were very highly correlated with the measures of child care.

No direct observations of child care were made.

Obviously interview data are somewhat unreliable. Unfortunately, the behavioral alternative of sitting at another person's home for days also grossly interfers with their normal activities. There is no simple solution to the problem of obtaining accurate child care information.

A small study (Kotelchuck and Shaw, 1976) was done to test the specific validity of interviews as the source of paternal child care involvement information. Each mother and father pair was asked to fill out child-care questionnaires independently evaluating the amount of time each parent spends in various child care and interactive tasks. The results show that mothers and fathers agree much more on what fathers do than on what mothers do. Intercorrelations for paternal tasks range from .5 to .9 with an average of about .7; while intercorrelations for maternal tasks average about .2. This politically interesting finding implies that mothers and fathers have different levels of awareness of each others child care tasks. The results of this study also indicate that there is moderate validity to parental reports of father caregiving activity, although one should always be aware of their limitations.

Paternal Child Care Characteristics

Despite the supposedly changing role of the father in our society, the traditional observation that mothers take care of their young children and fathers have minimal responsibility for childrearing was confirmed in these five studies. Middle class mothers in Boston in the 1970's still overwhelmingly had the

principal child care responsibilities in their families (Kotelchuck, 1972). Mothers spent more time with their children, 6 to 21 months of age, than fathers did (9.0 versus 3.2 hours, p. < .001) and were available essentially for the child's whole waking day. Mothers spent more time feeding their children (1.45 hours versus 0.25 hours, p. < .001) and cleaning their children (.92 hours versus .15 hours, p. < .001), then did the fathers.

Of the mothers, 64% were totally and solely responsible for the child's care; 9.1% shared child care responsibility with another person. Only 7.6% of the fathers shared infant care-taking responsibilities equally with their wives and only 25% total had any regular daily child care responsibilities. In other words, 75% of middle class fathers in Boston do not physically care for their children on a regular day-to-day basis. Even more remarkably, 43% of all the fathers report they never changed diapers at all! These data reveal that fathers were involved only in a minimal amount of the child's care, especially in those tasks of childrearing that are often viewed as routine and somewhat boring.

Mothers spent more absolute time playing with their children than did the fathers, (2.3 to 1.2 hours, p. < .01). Duration playing showed the least mother-father difference of any home caregiving measures. Moreover, fathers spent a greater percentage of their time with their children in play activities (37.5%) than mothers did (25.8%). The exact consequence of the differences in proportion of play to total time spent with a child is unclear, but it appears reasonable to suggest that this contri-

butes to the father's attractiveness to his child despite his restricted availability. Similarly, Lamb (1975) suggests that the different types of games mothers and fathers play with their infants also inhances the father's attractiveness.

Relation of Paternal Child-Care Involvement and Infant's Laboratory Behavior

In all the studies, infant and toddlers relate similarly to their mothers and fathers, irrespective of the vast differences in mother-infant and father-infant caretaking and interaction. Crude amount of caretaking or playing are, therefore, not the critical variables in determining who the child is comfortable with or to whom the child relates. Moreover, given the limited amount of paternal child-care activities found in most middle class families and the fact that most children relate to the r fathers in the laboratory situation, it should not be surprising that virtually no significant correlations were found between these two sets of data. There is no simple 1:1 relationship between amount of paternal child-care activities at home and the infant's laboratory behavior.

Yet, there is evidence that paternal care giving practices make a difference. First, there appears to be a minimum level of paternal caretaking necessary for a relationship to exist. In the initial study, (Kotelchuck, 1972), those few children who did not relate to their fathers (operationally defined as infants who did not spend at least 15 seconds in his proximity on arrival) came overwhelmingly from families with the lowest caretaking fathers ($x^2 = 7.9$, $p < .01$).

Also in Guatemala, where paternal caretaking and interaction is virtually nonexistent, it does make a difference in the children's behavior. Children in Guatemala related much less to their fathers then they do in the United States; e.g. they are less proximal , show less protest on paternal departures, etc. (Lester et al. 1974). Mother/father differences were more marked in Guatemala than in the U.S.; and stranger/father differences are lessened. Very very low paternal interaction seems to effect who the child relates to. Biller (1971) has noted, in a similar view, that children in families with the father absent or with very low interacting fathers seemed behaviorally similar. Perhaps some minimal level of interaction is necessary for a child to be basically comfortable with a person, but how little is yet unclear.

Second, the children's preferences and extensiveness of interaction with the father in the laboratory are partially related to paternal caregiving at home. Significant positive correlations are found between overall proximity to the father for 12 to 21 month old infants and extent of his caregiving, in the Kotelchuck (1972) laboratory study ($r = .35$, $p < 01$) and even more strongly in the Ross et al. (1974) home based study ($r = .43$, $p < .01$). A similar positive relationship was noted in Lewis, Weinraub and Ban (1972). Maternal proximity remained independent of paternal involvement. In neither Ross et al. (1974) or Kotelchuck (1972) was overall extensiveness of separation protest predicted by paternal involvement. Reported measures of caregiving activities were more predictive of the child's paternal preferences than were

play or interactive measures in both studies. The highest inter-correlation noted ($r = .51$, $p < .01$) occurred between paternal proximity in the joint mother-father present episodes (1, 7, 13) (i.e., episodes in which the child has a choice of which parent to go to) and the number of diapers changed by the father per week, (Ross et al., 1974).

The influence of paternal home child-care characteristics on the infant's interactive preferences with the father in experimental situations was more strongly seen in the home than in the laboratory. The laboratory is a more unfamiliar situation for the child and probably results in more unusual behaviors obscuring the association. But, paternal caregiving characteristics clearly influence the child's positive interactive behavioral preferences in experimental situations, be it in the child's home or in an unfamiliar setting.

Third, the age span of intense separation protest is shortened for the infant in families with multiple caretakers. That is to say, infants whose mothers and fathers both actively take care for them tend to show separation protest later and terminate it earlier than children with only a single mother caretaker.

The stratified study by Spelke et al., (1973), which looked at 36 12-month-old infants in three groups (12 each with high, medium and low interacting fathers) clearly demonstrated that the most separation distress (crying when left alone with a stranger) occured in infants with the lowest paternal involvement, an intermediate amount of distress in infants with medium paternal involvement, and the least distress in the infants with

highest paternal involvement ($F(4.60) = 3.32$, $p < .01$). That is to say, at 12 months of age, when protest first starts reliably occuring in laboratory situations in the United States, protest is inversely related to paternal involvement. Since protest occurs for almost all 15 and 18 month old infants (Kotelchuck, 1972) separation protest must be commenced at a later age for those children with higher paternal involvement. Stated differently, infants with high interacting fathers are less vulnerable to separation trauma at these younger ages.

These findings are generally supported by a similar finding at 12 months in the Kotelchuck (1972) study showing that the less frequently fathers bathed and dressed their infants at home, the greater amount of time the infants cried when left alone with a stranger ($r = -.40$, $p < .05$). Also consistent with these findings are the reports of earlier onset of separation protest in Guatemala (9 months of age) where there is virtually no paternal involvement (Lester et al. 1974), and an even earlier onset (6 months of age) in Ganda infants who are almost constantly carried on the mother's back (Ainsworth, 1967).

These findings imply that the age of onset of separation protest is partially a function of exclusiveness of maternal caregiving; exposure to more figures, including the father, appears to buffer the child from early separation distress. The child's familiarity or lack of familiarity with parental departures, should vary with the extent of care giver exclusiveness. One can hypothesize that infants are exposed to more parental departures in high paternal interacting and caregiving families

than in exclusive maternal caregiving families, perhaps making those infants less vulnerable to separation trauma at this very early age.

Likewise, a parallel finding occurs at the older end of the normal age range of separation protest in laboratory situations. Kotelchuck (1972) found that extensive separation protest at 21 months of age seems to occur principally in families with low caregiving fathers ($r = -.39$, $p < .05$) and hence in exclusive maternal caregiving families. Thus, overall, it appears that the age span of separation protest is shortened in high paternal interacting families.

Fourth, in none of the studies was paternal caregiving characteristics predictive of the child's ability to relate to or be friendly with an unfamiliar person. A relationship with a second familiar person does not obviously generalize to unfamiliar adults. Results from other studies show that avoidance of strangers remains high even among children "raised" in multiple caretaking contexts such as Day Care centers (Keaisley, Zelazo, Kagan and Hartman, 1975) or Kibbutzim (Maccoby and Feldman, 1973).

Fifth, there were virtually no sex differences in any of the studies. Boys and girls responded similarly to the experimental manipulations; they did not respond differentially to their parents on the basis of their sex.

An interesting sex difference did emerge, though it was not of the infants' interaction with the father, but the fathers' interaction with the infants. In the Boston area, fathers of first born children report that they play about half an hour a

day longer with their first born sons than with their first born daughters ($p < .001$). What the long term effect of this will be is not clear. However, at 21 months of age, the oldest age looked at in the Kotelchuck (1972) study, boys played more and interacted more with their fathers than boys played or interacted with their mothers. Early specific sex by parent interactions did not appear significant in any of the statistical analyses, although it is possible that the effects only begin to be manifested at older ages, such as 21 months of age.

The Intervention Study

Up until now, all the findings mentioned have been based on the results of the static correlational or stratification type paradigms in which the relation between the fathers' present care of his child and the child's present behavior is examined. Only by actively changing the father's interaction with the child and seeing if it really changes the child's behavior, can it be demonstrated that it is his caregiving and involvement alone, (and not some spurious characteristic of his wife, for example) that is truly influencing the child's behavior. This would require a Type 3 experimental methodology.

Zelazo, Barber, Kotelchuck, and David (1976) tried to experimentally manipulate father-child interaction. Twenty very low interacting fathers were selected, based on their answers to a child care questionnaire. These men did little or no caretaking, almost no playing, and were hardly present while their child was awake. Hence, the investigators had no qualms about asking them

to play 1/2 hour a day with their children for 4 weeks. All the children were first born males, 12 months of age. The fathers were given a schedule of games and toys to play; peek-a-boo, xylophones, jack-in-the-boxes, and so forth. The activities were chosen in order to guarantee that there would be some kind of structured interaction between the father and his son. A house visitor trained the father, checked on his playing and gave him a chart which he and his wife were supposed to check off each night after he played the prescribed games.

The design was a classic before-after design. All the parents and infants came to the laboratory for one pre-intervention testing. In half the cases, the intervention occurred (the experimental group) and in half nothing happened (the controls). After 6 weeks all were retested in the laboratory to look for differences. The paradigm was slightly different from the other four studies in that there was a 20 minute free play period, with both the parents in the room reading, followed by a modified series of maternal and paternal departures.

While these are still preliminary results, it is clear that this limited intervention markedly influenced the children in the experimental group. First, in the free play session, children in the experimental group increased their interaction with their fathers; they spent more time near them, initiated more interaction with them, and looked at them more. These changes occured despite the stability in the fathers' interaction toward their children across the two testings; that is, the fathers showed no increases in their looking at their children or their

initiation of interaction. This stability was probably influenced by our instructions which urged him not to initiate interactions. Second, there was a decrease in reliance on the mother for the experimental group; there was less maternal touching, vocalizations, and fixations. By contrast, infants in the control group increased interaction with their mothers. Third, there was an increase in the use of the father during the separation or stress episodes; paternal proximity, fixation, touching increased, especially after the departure of the mother, although no changes in the duration of crying or playing (the overt protest measures) were noted.

The results strongly imply that paternal interaction at home can directly influence the behavior of the infants in a laboratory situation. Father-infant interaction is not something immutable. If a father changes his behavior, it can have an immediate effect in changing his child's behavior toward him.

In summary, the five studies reviewed in this paper all demonstrate that the father's involvement with his infant directly influences the infant's early social behavior. While a relationship to the father was seen to be independent of the extent of his involvement in child care, some minimal level of interaction seemed necessary. Extensive paternal caregiving was related to the preferences for the father in the laboratory and shortened duration of separation protest. What might be the positive long-term effects of increased father-infant interaction remains to be explored. The immediate influence of the father on his infant's behavior can no longer be doubted.

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